

**IN THE UNITED STATES DISTRICT COURT FOR THE  
EASTERN DISTRICT OF WISCONSIN**

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MILWAUKEE ELECTRIC TOOL	)	
CORPORATION, METCO BATTERY	)	
TECHNOLOGIES, LLC, AC	)	
(COMMERCIAL OFFSHORE DE MACAU)	)	Case No.: 09-cv-00948-WEC
LIMITADA, and TECHTRONIC	)	
INDUSTRIES CO. LTD.,	)	PATENT CASE
	)	
Plaintiffs,	)	JURY DEMANDED
	)	
v.	)	
	)	
HITACHI KOKI CO., LTD., and HITACHI	)	
KOKI USA, LTD.,	)	
	)	
Defendants.	)	
	)	

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**PLAINTIFFS' OPENING CLAIM CONSTRUCTION BRIEF**

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## I. INTRODUCTION

Plaintiffs Milwaukee Electric Tool Corporation, Metco Battery Technologies LLC, Techtronic Industries Co. Ltd., AC Commercial Offshore De Macau Limitada (collectively “Metco”) sued Defendants Hitachi Koki Co., Ltd. and Hitachi Koki USA Ltd. (collectively “Hitachi”) for infringing seven Metco patents relating to rechargeable power tool batteries and chargers for power tools. The seven patents-in-suit are:

1. U.S. Patent No. 7,554,290 (“the ’290 patent”) is entitled Lithium-based battery pack for a hand-held power tool. Metco asserts claims 1, 6, 8, 9, and 10 of this patent. Attached to the White Declaration as Ex. 1.
2. U.S. Patent No. 7,999,510 (“the ’510 patent”) is entitled Lithium-based battery pack for a high current draw, hand held power tool. Metco asserts claims 1, 6, 7, 9, and 16 - 19 of this patent. Attached to the White Declaration as Ex. 2.
3. U.S. Patent No. 7,944,173 (“the ’173 patent”) is entitled Lithium-based battery pack for a high current draw, hand held power tool. Metco asserts claims 1, 9, and 12 of this patent. Attached to the White Declaration as Ex. 3.
4. U.S. Patent No. 7,164,257 (“the ’257 patent”) is entitled Method and system for protection of a lithium-based multicell battery pack including a heat sink. Metco asserts claims 1-3 and 12 of this patent. Attached to the White Declaration as Ex. 4.
5. U.S. Patent No. 7,176,654 (“the ’654 patent”) is entitled Method and system of charging multi-cell lithium-based batteries. Metco asserts claims 1, 23, 57, 58, and 62 of this patent. Attached to the White Declaration as Ex. 5.
6. U.S. Patent No. 7,323,847 (“the ’847 patent”) is entitled Method and system of charging multi-cell lithium-based batteries. Metco asserts claims 1, 9, and 10 of this patent. Attached to the White Declaration as Ex. 6.
7. U.S. Patent No. 7,508,167 (“the ’167 patent”) is entitled Method and system for charging multi-cell lithium-based batteries. Metco asserts claims 1, 8, 12, and 15 of this patent. Attached to the White Declaration as Ex. 7.

The parties have agreed on the construction of one term which appears in both the ’290 and ’510 patents. The parties dispute the proper construction of three terms that are common to the ’290, ’510, and ’173 patents; six terms from the ’257 patent; seven terms in the ’654 patent, two of which are common to ’847 patent; and nine terms from the ’167 patent.

## **II. FACTUAL AND TECHNOLOGICAL BACKGROUND**

Historically, cordless power tools were powered by battery packs with either a Nickel-Cadmium (“NiCd”) or Nickel Metal Hydride (“NiMH”) chemistry. In the early 2000s, prior to Metco’s inventions, there was wide-spread belief in the power tool industry that a lithium based battery pack was not suitable for hand held power tools. The power tool industry knew what was generally required of hand held power tool battery packs – high current, high capacity, and small pack size/weight. However, no one was able to produce a battery pack that could fulfill these requirements. In the electric car industry, lithium based rechargeable battery packs were high current and high capacity, but were also significantly larger in volume and weight than those required for hand held power tools. In the consumer electronics industry, lithium based rechargeable battery packs were small and lightweight, but they did not have a high enough discharge current capability for hand held power tools. For this reason, none of the lithium based rechargeable battery packs that were developed before Metco’s lithium based rechargeable battery packs were applicable to the hand held power tool industry.

Metco’s lithium based battery pack provided high current, high power, and could fit into a hand held power tool. As a result, for the first time, lithium became a viable option for the hand held power tool industry. The seven patents-in-suit are the direct result of Metco’s ground breaking developments in the power tool industry. Metco’s line of lithium based hand-held power tools were the first to market and received numerous awards from its peers in the cordless power tool industry.

Ever since Metco launched the first lithium battery packs, lithium became the preferred method of powering hand held power tools as compared to the NiCd and NiMH predecessors. Lithium is the lightest of all metals, has the greatest electrochemical potential, and provides more energy with less weight. Accordingly, lithium-ion based battery packs are lightweight, have a

slow loss of charge when not in use, and have twice the energy density of standard NiCd batteries. Lithium-based battery packs also can produce a very high discharge current, which is a feature of particular importance for use in the power tool industry.

Despite all of these advantages, lithium battery chemistry does have some drawbacks. For example, it is more volatile than NiCd and NiMH chemistry. To manage this volatility, lithium-ion based battery packs require circuitry to control various characteristics of the battery pack, such as the discharging and charging rate, the temperature of the individual cells, and the voltage of the individual cells. Many of the advancements provided by Metco, and as claimed in the patents-in-suit, relate to those control strategies. In the absence of circuitry to monitor and control the lithium cells, the battery cells will perform poorly, such as by insufficiently charging or losing capacity (voltage) over time, or the battery cells can become permanently damaged, such as when excessive heat prevents the battery cells from fully charging or when the cells become so hot that they explode and start a fire.

The seven patents-in-suit each cover different aspects of Metco's inventions that allowed lithium-ion battery pack technology to be safely and commercially used with hand held power tools. The '290, '510, and '173 patents broadly cover rechargeable lithium-ion battery packs for powering a hand held power tool that requires high current. The '257 patent broadly covers a lithium-ion battery pack for a power tool with a heat sink that allows heat to dissipate from the battery pack so the temperature does not become too high and degrade or even destroy the battery cells. The '847, '654, and '167 patents broadly cover a unique method of charging battery packs to prevent the battery cells from being damaged by charging unevenly or becoming too hot.

### **III. LEGAL STANDARD**

A patent infringement analysis involves two steps: first, the court determines the meaning and scope of the patent claims; second, the fact-finder compares the accused device to the construed claims to determine whether the device infringes. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 384 (1996), *aff'd*, 178 F.3d 1306 (Fed. Cir. 1998); *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998) (en banc). Under the first step, the interpretation of patent claims is a question of law for the court. *Markman*, 517 U.S. at 387-91. The goal is to explain the words in a claim without changing the scope of the claim. *Gart v. Logitech*, 254 F.3d 1334, 1339 (Fed. Cir. 2001). The appropriate perspective for analyzing the meaning of a claim term is of a person having ordinary skill in the art at the time the patent application was filed. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc), cert. denied, 546 S. Ct. 1170 (2006). In this case, Metco's expert, Dr. Ehsani, has opined that "a person of ordinary skill in the art for the '290 patent, '257 patent, '654 patent, '847 patent, and '167 patent would have a Bachelor's degree in Electrical Engineering and at least two years of experience designing cordless power tools including experience with battery design and battery makeup." Plaintiff's Expert Report of Dr. Ehsani, January 14, 2011, ¶ 16. Attached to the White Declaration as Exhibit 8 (hereafter "Ex. 8, Pl. Ex. Rpt.").

In *Phillips v. AWH Corp.*, the Federal Circuit sitting en banc summarized the law of claim construction. *Phillips*, 415 F.3d at 1312. The Federal Circuit instructed courts to focus on the "intrinsic evidence" while construing claims – namely, the patent claims and specification along with the prosecution history. *Id.* at 1317; *see also Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). The most important inquiry is to look at the language of the claims themselves. *Vitronics*, 90 F.3d at 1582. But claims always "must be read in view of the specification, of which they are a part" because it is "the single best guide to the meaning of a

disputed term.” *Phillips*, 415 F.3d at 1315-16 (citation omitted). The specification may indicate whether the patentee expressly defined any of the claim terms. *See Vitronics*, 90 F.3d at 1582. “In such cases, the inventor’s lexicography governs.” *Phillips*, 415 F.3d at 1316.

While the intrinsic record is the primary focus of the claim construction inquiry, courts may also rely on extrinsic evidence such as dictionaries, treatises, and expert testimony. *Id.* at 1317-18 (“[T]he court has observed that dictionaries and treatises can be useful in claim construction . . . [and] extrinsic evidence in the form of expert testimony can be useful to a court for a variety of purposes, such as to provide background on the technology at issue, to explain how an invention works, to ensure that the court’s understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field.”).

In addition to these general rules, claim elements may be expressed as a means for performing a specific function, so-called “means-plus-function” claims. 35 U.S.C. § 112, ¶ 6. Means-plus-function terms are construed to cover the corresponding structure described in the specification for performing the claimed function and its equivalents. *Id.* For example, a claim reciting a means to ignite a fire consisting of at least two sticks would not include a lighter if the patentee only disclosed sticks as the corresponding structure to ignite a fire and a lighter was determined to not be the equivalent of sticks.

Construction of a means-plus-function element entails a preliminary inquiry to determine if the claim is subject to 35 U.S.C. § 112, ¶ 6. Only if the element is determined to be a means-plus-function claim is the court then required to complete a two step process of interpreting the claim. As to the preliminary inquiry, the Federal Circuit holds that when the claim language does not include the term “means” there is a rebuttable presumption that §112, ¶ 6 does not

apply. *Lighting World, Inc. v. Birchwood Lighting*, 382 F.3d 1354, 1360-61 (Fed. Cir. 2004). This presumption can only be overcome if the claim term fails to recite sufficiently definite structure. *Id.* (citing *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1369 (Fed. Cir. 2002) (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000))). The Federal Circuit has made clear, however, that the “presumption flowing from the absence of the term ‘means’ is a strong one that is not readily overcome.” *Id.* (citing *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1318-19 (Fed. Cir. 1999); *Personalized Media Comms., LLC v. Int'l Trade Comm'n*, 161 F.3d 696, 703 (Fed. Cir. 1998)).

If the claim is to be construed pursuant to 35 U.S.C. § 112, ¶ 6, then the first step is to identify the claimed function, while staying true to the claim language and its functional limitation as expressly stated in the claim. *See, e.g., Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1332 (Fed. Cir. 2006); *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1322 (Fed. Cir. 2003). Second, the court must identify the structure in the written description that corresponds to the properly construed functional language. *Applied Med. Res.*, 448 F.3d at 1332; *JVW Enters., Inc. v. Interact Accessories, Inc.*, 424 F.3d 1324, 1330 (Fed. Cir. 2005). In particular, “structure disclosed in the specification is ‘corresponding’ structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997).

## **IV. AGREED TERMS**

### **A. The '290 and '510 Patents**

<b>Term</b>	<b>Agreed Construction</b>
“battery cells have an ampere-hour capacity of approximately 3.0 ampere-hours”	“individual battery cells have an ampere-hour capacity reasonably close to 3.0 ampere-hours”

The parties have agreed to the construction of this term.

## **V. DISPUTED TERMS FOR CONSTRUCTION**

### **A. The '290, '510, and '173 Patents**

The '510 and '173 patents are continuations of the '290 patent; as such, all three patents share a common specification. For this reason, in this section, they will be addressed together with all citations in the brief directed to the '290 patent.

- 1. the '290 and '510 patent: “the battery cells being capable of producing an average discharge current greater than or equal to approximately 20 amps”**

<b>The '290 and '510 Term</b>	<b>Metco's Construction</b>	<b>Hitachi's Construction</b>
“a plurality of battery cells supported by the housing, <b>the battery cells being capable of producing an average discharge current greater than or equal to approximately 20 amps</b> , the battery cells having a lithium-based chemistry.”	“the battery cells, when configured together in a battery pack, are capable of producing reasonably close to 20 amps of discharge current or greater over the course of delivering their entire rated capacity”	“each of a plurality of battery cells having the ability to discharge about 20 amps of current over any non-trivial period of time”

**2. the '173 patent: “battery cells capable of producing an average battery pack discharge current greater than or equal to approximately 20 amps”**

The '173 Term	Metco's Construction	Hitachi's Construction
“a plurality of battery cells supported by the housing, <b>the battery cells being capable of producing an average battery pack<sup>1</sup> discharge current greater than or equal to approximately 20 amps</b> , the battery cells having a lithium-based chemistry”	“the battery cells, when configured together in a battery pack, are capable of producing reasonably close to 20 amps of discharge current or greater over the course of delivering their entire rated capacity”	“the plurality of battery cells having the ability to discharge about 20 amps of current from the battery pack over any non-trivial period of time”

The '290 and '510 patents include the same term and the '173 patent includes a nearly identical term. The parties have two disputes for the term in the '290 and '510 patents, one of which overlaps with the one dispute for the term in the '173 patent. For the '290 and '510 patents, the first dispute relates to whether the battery pack or the individual cells produce 20 amps of discharge current and that dispute is unique to these two patents. The second dispute relates to the time period over which the 20 amps of discharge current is provided, and this dispute arises in connection with all three patents.

With respect to the first dispute, the key question is whether the 20 amp discharge current is produced by the battery pack, made up of the plurality of cells, as proposed by Metco, or by only each individual cell in the battery pack, as proposed by Hitachi.<sup>1</sup> Metco's proposed construction of this term flows directly from the claim language itself and other intrinsic evidence. The preamble states that claim 1 is directed to a “battery pack,” not to an individual cell in the battery pack. (Ex. 1, the '290 patent, claim 1). Furthermore, the claim itself is

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<sup>1</sup> With respect to the '173 patent, Hitachi agrees with Metco that average discharge current is produced by the entire battery pack and not by each individual cell.

directed to the entire battery pack, not to the specific individual cells inside the battery pack. (Ex. 1, the '290 patent, col. 12, lns. 18-20) (Claim 1 states “a plurality of battery cells supported by the housing, the battery cells being capable of producing an average discharge current greater than or equal to approximately 20 amps”) (emphasis added). By using the indefinite article “a” and then using the definite article “the” the inventors explicitly stated that the “battery cells” should be regarded the same as the previously mentioned “plurality of battery cells.”

The specification also confirms that the 20 amp discharge current is produced collectively by the plurality of cells in the battery pack and not just by an individual cell. (Ex. 1, the '290 patent, col. 10, lns. 23-26) (“*the* battery pack 30 can supply an average discharge current that is equal to or greater than approximately 20 A”). In addition to this explicit disclosure in the '290 patent, a person of ordinary skill in the art would also understand that the 20 amp discharge current in claim 1 refers back to the “battery pack for powering a hand held power tool” and the “plurality of battery cells supported by the housing” recited in the claims. Plaintiff’s Expert Rebuttal Report of Dr. Ehsani, February 4, 2011, ¶ 8. Attached to the White Declaration as Exhibit 9 (hereafter “Ex. 9, Pl. Ex. Reb. Rpt.”).

Hitachi argues that this term should be construed such that the 20 amp discharge current is produced by only one individual cell in the battery pack. However, Hitachi’s construction is neither supported by the claim or the specification. As to the claim, the explicit language is directed to a battery pack with a plurality of cells. (Ex. 1, the '290 patent, col. 12, lns. 18-20). Furthermore, at no point does the specification describe the 20 amp discharge current of an individual cell, in fact, it explicitly refers to the entire battery pack. (Ex. 1, the '290 patent, col. 10, lns. 23-26). Thus, by seeking to introduce the limiting term “each” into its proposed definition, Hitachi is improperly ignoring the intrinsic record. *Vitronics Corp. v. Conceptronic*,

*Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) (“such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language”); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1319 (Fed. Cir. 2005) (the specification is “the single best guide to the meaning of a disputed term,” such that “usually, it is dispositive.”).

With respect to the second dispute, the key issue is whether the average discharge current should be measured during the entire discharge period of the battery pack, as proposed by Metco, or over a shorter “non-trivial” period of time of battery discharge, as proposed by Hitachi. Support for Metco’s position is found throughout the intrinsic evidence. For example, the specification discloses use of a battery pack to power high discharge current tools, such as a circular saw. Ex. 1, the ’290 patent, col. 10, lns. 20-22). The specification then states that the average discharge current during operation of this tool is approximately 20 A. (*Id.* at col. 10, lns., 23-26). Nowhere does the specification suggest that it is limited to only operating the saw for some “non-trivial” period of time.

These disclosures in the specification are supported by the prosecution history, in particular the Meyer declaration. Meyer, one of the co-inventors of the patents-at-issue, submitted a declaration to the USPTO that discusses tests he performed on a prototype lithium-ion battery pack. Meyer states that he used a constant current discharge test because that test was regularly used by manufacturers of power tools to determine whether a particular battery product was suitable for powering a particular tool over its entire rated capacity. Meyer Declaration to the USPTO, March 19, 2009, ¶ 6. Attached to the White Declaration as Ex. 10 (hereafter “Ex. 10, Meyer Decl.”); Ex. 9, Pl. Ex. Reb. Rpt. ¶ 21. As explained by Mr. Meyer, “[c]onstant current discharge tests were and are tests commonly used by power tool manufacturers to assess the suitability of a battery product for powering a tool.” Ex. 10, Meyer Decl. ¶ 6. He went on to

explain that his tests were “conducted under a constant discharge current of 20 amps ‘and’ set up to disconnect the Pack when the voltage fell below the low voltage threshold recommended by [the manufacturer.]” *Id.* at ¶ 6-7. While the prototype pack failed to produce satisfactory results in the constant current discharge test, his description of the constant discharge test sheds additional light on to how this term is understood by a person of ordinary skill in the art.

In addition to the claim language and the other intrinsic evidence confirming that the average discharge current should be measured during the entire discharge period of the battery pack, extrinsic evidence also supports this conclusion. As explained by Dr. Ehsani, a person of ordinary skill in the art would understand that a battery’s ability to deliver current is described as its rated capacity, noted in ampere-hours, and is measured by discharging the battery pack at a constant current until the battery reaches its terminal voltage (i.e. until the battery will no longer provide sufficient current to operate the device). Ex. 8, Pl. Ex. Rpt. ¶ 21; Ex. 9, Pl. Reb. Ex. Rpt. ¶ 14. The battery pack claimed in the ’290 patent is rated at 3.0 amp-hours and operates at an average discharge current of 20 A. Thus, a person of ordinary skill in the art would recognize that it should operate at full power (i.e., delivering approximately 20 A) for approximately nine minutes without failing (i.e. without the voltage dropping so low that it creates permanent damage or a fire risk). As such, the cordless power tool industry has a custom for measuring the discharge of a battery, and Metco’s claims do not suggest any reason to deviate from that custom.

Despite the disclosures in the specification, and the description in the Meyer Declaration of a standard industry test along with an example of how that test is conducted, Hitachi argues that the average discharge current should be measured over a shorter “non-trivial” period of time during battery discharge. Hitachi’s proposed construction of “over any non-trivial period of

time” cannot be found in any part of the intrinsic record. In fact, it is directly contradictory to the Meyer Declaration, which made clear that the tested prototype pack was unacceptable because it could not produce 20 A of current over its entire rated capacity and, therefore, failed to meet the limitations of the claims of the ’290 patent even though it did provide 20 A of current for a short period of time. In addition, rather than providing clarity to the term “average discharge current,” Hitachi’s proposed construction actually introduces unnecessary ambiguity to the term by including the phrase “non-trivial period of time.” It is unclear what “non-trivial” means in the context of the claims of the ’290 patent, and on that basis alone, it should not be part of construction of this term.

Based on the above reasons, the proper definition of the term “the battery cells being capable of producing an average discharge current greater than or equal to approximately 20 amps” must encompass both of the features included in Metco’s proposed construction: measuring the 20 amp discharge current of the entire battery pack and measuring the average discharge current during the entire discharge period of the battery pack.

### **3. the ’290, ’510, and ’173 patents: “hand held power tool”**

<b>Term</b>	<b>Metco’s construction</b>	<b>Hitachi’s construction</b>
“a housing connectable to and supportable by the <b>hand held power tool</b> ”	“a power tool that can be held in and supported by the operator’s hand or hands”	“a power tool capable of being operated while held in the hand”

The primary dispute between the parties is whether the hand held power tool must be capable of being held in **and supported by** a hand, as Metco proposes, or whether it need only be capable of being operated while held in the hand, as Hitachi proposes. While the difference between these two proposed constructions may seem minor, it is actually significant because Metco’s construction properly limits the term to power tools that are truly hand held, whereas Hitachi’s proposed construction could impermissibly broaden the claim to include larger tools

that can be operated by hand but cannot be supported by the operator's hand. An example of a power tool that would be included within Hitachi's definition, but not Metco's, is a table saw. A table saw can be operated by hand, but because it rests on the floor or on a workbench, it is not supported by the operator's hand.

Metco's construction is grounded in the claim language. Claim 10 states that two examples of a hand held power tool are driver drills and circular saws, both of which can be held in and supported by the operator's hand. Ex. 1, the '290 patent, claim 10 ("The battery pack as set forth in claim 1, wherein the power tool is one of a driver drill and a circular saw"). The specification also discloses examples of cordless power tools, all of which can be held in and supported by the operator's hand. Ex. 1, the '290 patent, col. 5, lns. 42-45 ("The battery pack 30 can be connectable to electrical equipment, such as, for example, a cordless power tool 34 (shown in FIG. 11A) to selectively power the power tool 34") (referencing a cordless driver drill); *see also id.* at Fig. 55-56.

Despite these explicit disclosures in the specification, Hitachi's proposed construction impermissibly broadens the scope of the claim to include any tool that is operated by hand, even if the tool could not be supported by the operator's hand during operation. This is improper because the goal of claim construction is to explain the words in a claim without expanding the scope of the claim. *Gart v. Logitech*, 254 F.3d 1334, 1339 (Fed. Cir. 2001). Hitachi's proposed construction is contrary to the express wording of the claims and the disclosure in the '290 patent and is thus improper. As such, the construction of the term "hand held power tool" must indicate that the power tool is not only operated by a hand, but is also held in and supported by the operator's hand, as Metco has proposed.

## B. The '257 Patent

### 1. “state of charge”

Term	Metco’s construction	Hitachi’s construction
“each of the battery cells having a respective <b>state of charge</b> ;” “a <b>state of charge</b> of the battery pack”	“the amount of charge remaining”	“the amount of charge remaining at a given time for a battery cell” (when modifying a battery cell); “the amount of charge remaining at a given time for a battery pack” (when used to modify battery pack”)

The dispute between the parties as to the term “state of charge” is whether it should include the temporal limitation “at a given time,” as Hitachi argues, or whether this term is not bound by any temporal limitation, as Metco proposes. While both parties agree that the state of charge can be measured at a given point in time, the real dispute is whether the state of charge can be determined simply by knowing how long a battery cell or pack has been used. Hitachi’s proposed construction implies that the state of charge is a direct function of time, while Metco’s proposed construction does not. The actual state of charge of a battery pack/cell at any point in time is determined by numerous battery pack/cell conditions, such as discharge current magnitude and duration, temperature, load, number of prior charge/discharge cycles, etc.

Metco’s proposed construction holds true to the claim language, which does not include any temporal limitation. Had the inventors wanted to include a temporal limitation when they used this term, they could have done so like they did in other instances in the specification. In particular, the inventors disclosed various embodiments of the invention in the specification, some of which included a temporal limitation and some which did not. For example, compare this disclosure of a temporal limitation, which describes that time is a factor in determining the state of charge:

“By interrupting the discharge current for a period of time, the large fluctuations in **state of charge** may reduce, and the voltage of the battery cells 80 may rise”

Ex. 4, the ’257 patent, col. 10, lns. 46-49 (emphasis added), with this disclosure where the state of charge is not a function of time, but instead of voltage:

“the microprocessor 140 may need a voltage source of approximately 3 V or approximately 5 V in order to operate. If the present **state of charge** of the battery 50 falls below about 5 V or about 3 V then the microprocessor 140 may not receive enough power to operate and control the remainder of the components included in the circuit”

*id.* at col. 9, lns. 45-50. As such, when the inventors wanted to impose a temporal limitation, they knew how to and did, but they did not include a temporal limitation in the patent claims.

Despite the intrinsic evidence and the language of the claims, which do not include a temporal limitation, Hitachi’s proposed construction improperly seeks to include a temporal limitation by including the phrase “at a given time.” This would inappropriately limit the claim by importing a specific limitation from the specification, which under black letter law is inappropriate. The Federal Circuit often “caution[s] against limiting the claimed invention to preferred embodiments or specific examples in the specification.” *Teleflex, Inc. v. Ficosa North America Corp.*, 299 F.3d 1313 (Fed. Cir. 2002). In addition, importing this limitation would run directly counter to other examples in the specification where the temporal limitation is not a specific, exact time, but instead used as an approximation of the amount of charge remaining.

Ex. 4, the ’257 patent, col. 8, lns 13-25, col. 8, lns 37-46, col. 20, lns 15-27.

Therefore, adopting Hitachi’s proposed requirement that the term “state of charge” include a temporal limitation in every context would be contrary to the clear intent of the inventors and the explicit disclosure of temporally limited and temporally unlimited embodiments in the specification. Furthermore, Hitachi’s proposed construction is also

inconsistent with how a person of ordinary skill in the art would understand this term having read the specification. *See* Ex. 8, Pl. Ex. Rpt. ¶ 25.

Accordingly, the term “state of charge” must not be limited by any specific embodiment in the specification, and thus must not be restricted by any temporal limitations.

## 2. “control circuit supported by the housing”

Term	Metco’s construction	Hitachi’s construction
“a control circuit supported by the housing and operable to control a plurality of functions of the battery pack including discharging functions”	“control circuit connected either directly or indirectly to the housing”	“a circuit that performs a control function and is located entirely within and mounted to the battery pack housing”

The primary dispute between the parties is whether the control circuit is connected (directly or indirectly) to the housing, as proposed by Metco, or whether the control circuit must be entirely inside and mounted to the housing, as proposed by Hitachi. This difference is important because Hitachi’s proposed construction limits the claim to a specific configuration that is not called for anywhere in the patent.

Metco’s proposed construction is guided by the claim language, which states that only certain features of the battery pack, not including the control circuit, need to be both “supported by” and “located within the housing.” Ex. 4, the ’257 patent, claim 1 (“battery cells arranged within and supported by the housing”). For other features, including the control circuit, the patent is clear that it only need be “supported by” the housing. *Id.* at claim 1 (“a control circuit supported by the housing”). Given the patent’s explicit statement that the control circuit is only “supported by” the housing, as compared to its statements about the battery cells being arranged “within” the housing, Metco’s proposed construction aligns with the claim language.

Conversely, Hitachi's proposed construction would eviscerate the unequivocal claim language by adding limitations that are not present in the actual claim. This is improper, and Hitachi's attempt to add limitations that are not present in the claims should be rejected. For this reason, the term "control circuit supported by the housing" must not improperly include a limitation that the inventors chose to include elsewhere in the claim, but did not apply to this term.

**3. "control circuit configured to monitor the respective state of charge of each of the battery cells, a state of charge of the battery pack, and a battery pack temperature"**

Term	Metco's construction	Hitachi's construction
<b>"the control circuit configured to monitor the respective state of charge of each of the battery cells, a state of charge of the battery pack, and a battery pack temperature"</b>	"control circuit capable of monitoring the amount of charge remaining in each of the battery cells, the amount of charge remaining in the battery pack, and a battery pack temperature"	"a circuit that obtains information regarding the state of charge of each of the plurality of battery cells of the battery pack, as well as the state of charge of the battery pack, and information indicative of the present temperature of the battery pack"

The primary dispute between the parties is whether the control circuit must simply be capable of monitoring each aspect of the battery cells, as proposed by Metco, or whether the control circuit must actually monitor and then obtain information about these characteristics, as proposed by Hitachi.

Metco's proposed construction is based on the plain and ordinary meaning of the words in the claim. The Federal Circuit has long held that, absent a special and particular definition created by the patent applicant, terms in a claim are to be given their ordinary and accustomed meaning. *Renishaw PLC v. Marposs Societa Per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998). For this term, the word "configured" merely requires the control circuit to be capable of (i.e.

designed to) monitor each characteristic. (Visit <http://dictionary.reference.com> then search for “configured”) (“to design or adapt to form a specific configuration or for some specific purpose”). Metco’s proposed construction of “configured” is also consistent with how other courts have construed this term. *See Cardiac Science, Inc. v. Koninklijke Philips Electronics N.V.*, 2006 U.S. Dist. LEXIS 22267 (D. Minn., April 20, 2006) (holding that the term “configured for electrical interconnection” merely requires “that the second end of the insulated lead wire *allows for* electrical interconnection”) (emphasis added); *Diego, Inc. v. Audible, Inc.*, 2006 U.S. Dist. LEXIS 22715 (W.D. Wash., March 27, 2006) (holding that the term “configured to encrypt” merely requires the system to be “*capable of* encrypting”) (emphasis added).

Hitachi’s proposed construction, on the other hand, goes beyond the ordinary and plain meaning by requiring the control circuit to monitor and then actually obtain information about these characteristics. This is wrong for two reasons. First, this is an apparatus claim, not a method claim,<sup>2</sup> and as such, it is inappropriate to construe this term as requiring any particular action. It is black letter law that use of a device is not required to infringe an apparatus claim because merely making (i.e. manufacturing) is sufficient to establish infringement under 35 U.S.C. § 271 (“whoever without authority makes . . . any patented invention . . . infringes the patent.”). To infringe an apparatus claim, the device must meet all of the structural limitations. *See Hewlett-Packard Co. v. Bausch & Lomb, Inc.*, 909 F.2d 1464, 1468 (Fed. Cir. 1990) (“[A]pparatus claims cover what a device is, not what a device does.”). Based on this requirement “[i]t is well settled that patentability of apparatus claims must depend upon structural limitations and not upon statements of function.” *Cross Medical Products, Inc. v.*

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<sup>2</sup> An apparatus claim covers the physical structure of an item, for example, a wooden rocking chair. A method claim covers the process of making or doing something, for example how a carpenter turns a piece of wood into the arm piece of the rocking chair.

*Medtronic Sofamor Danek*, 424 F.3d 1293, 1311-12 (Fed. Cir. 2005) (quoting *In re Michlin*, 45 C.C.P.A. 1028, 256 F.2d 317, 320 (1958)). As such, Hitachi’s proposed construction impermissibly limits the scope of possible infringement of this claim to “use,” despite the fact that the scope of this claim actually covers making, using, offering to sell, and selling. *Id.*; see also 35 U.S.C. § 271. To return to the rocking chair example from footnote 2, if the patent claims a rocking chair and the infringer builds a rocking chair, it does not matter whether the infringer actually ever rocks in the rocking chair.

Second, Hitachi’s proposed construction is also incorrect because it includes a limitation that is not found in the claim. Not only is it improper to import embodiments from the specification to limit the claim, but the statements that Hitachi relies on do not even support its position. For example, the specification merely states that the control circuit senses certain abnormal battery conditions which “*can include*” the temperature, state of charge, discharge current, and charge current. Ex. 4, the ’257 patent, col. 11, lns. 42-52. As such, the specification discloses that the control circuit *may* actively monitor these characteristics; it does not disclose a control circuit that *must* actively monitor these characteristics in every instance and obtain information about them. Hitachi’s construction is also inconsistent with how a person of ordinary skill in the art would understand this claim term having reviewed the intrinsic evidence. Ex. 8, Pl. Ex. Rpt. ¶ 28.

For this reason, the term “control circuit configured to monitor the respective state of charge of each of the battery cells, a state of charge of the battery pack, and a battery pack temperature” must be construed such that the control circuit is only required to be capable of monitoring each aspect of the battery cells, as proposed by Metco.

**4. “the control circuit further configured to control at least one function of the battery pack based on the monitored respective states of charge of the battery cells, the monitored state of charge of the battery pack or the monitored battery pack temperature”**

Term	Metco’s construction	Hitachi’s construction
<b>“the control circuit further configured to control at least one function of the battery pack based on the monitored respective states of charge of the battery cells, the monitored state of charge of the battery pack, or the monitored battery pack temperature”</b>	“the control circuit further configured to control at least one function of the battery pack after considering one or more of the monitored amount of charge remaining in the battery cells, the monitored amount of charge remaining in the battery pack, or the monitored battery pack temperature, though other information can also be used or considered”	“the circuit controls at least one function of the battery pack based on at least one of the following criteria: (i) the present state of charge of each one of the plurality of battery cells, (ii) the present state of charge of the battery pack, or (iii) the present temperature of the battery pack”

The parties dispute two aspects of this term. First, the dispute over this term is the same as the dispute of a similar term in the ’257 patent, pg. 18 above. The primary dispute over this term centers on whether the control circuit must simply be capable of monitoring each aspect of the battery cells, as proposed by Metco, or whether the control circuit must monitor and then actually obtain information about these characteristics, as Hitachi argues. In addition, the parties also dispute what information the control circuit must consider prior to performing the control function.

With respect to the first issue, Metco incorporates its explanation with respect to this term from the ’275 patent, pg. 18 above. In summary, the term configured should be construed as being capable of performing the recited tasks because that is the plain and ordinary meaning of the word, because that is how other courts have construed this term, and because adopting Hitachi’s proposed construction would improperly limit this claim to functions, like a method claim, even though the Federal Circuit holds that infringement of an apparatus claim “must

depend upon structural limitations and not upon statements of function.” *Cross Medical Products*, 424 F.3d at 1311-12.

As to the second issue this intrinsic evidence supports Metco’s proposed construction.

The circuit’s monitoring function is designed to enhance the performance of the battery by monitoring certain battery characteristics, such as voltage and temperature, and to determine whether further action is required. Ex. 4, the ’257 patent, col. 6, lns. 50-65. Additionally, the specification clearly refers to embodiments where the control circuit monitors other information, not merely the information that is specified in the claim. *See* Ex. 8, Pl. Ex. Rpt. ¶ 30. By way of example, the control circuit may monitor the battery pack temperature and determine that no action is necessary. *Id.* Similarly, the control circuit may monitor the battery pack voltage, determine that it is too high, and subsequently cut off current from the battery. *Id.* In other words, the control circuit can monitor characteristics of the battery and then either take no action or take action to control at least one function of the battery pack. Based on these disclosures from the specification, this term should be construed such that the control circuit may or may not control a function of the battery pack after considering one of the mentioned characteristics, and possibly other characteristics.

Contrary to the intrinsic evidence, Hitachi’s proposed construction attempts to import limitations into the claim by requiring that the circuit respond to a limited set of inputs and measure the “present” state of charge. Hitachi’s proposed construction improperly limits the circuit to responding to three inputs to the exclusion of other inputs, despite the fact that the specification discloses multiple inputs. Ex. 8, Pl. Ex. Rpt. ¶ 30. Furthermore, including Hitachi’s extraneous temporal limitation would also eliminate other disclosed embodiments in

the specification. For example, the specification discloses several embodiments that do not include any temporal limitations:

- “the boosting circuit 171d may be activated in response to certain battery conditions such as...low battery state of charge”; Ex. 4, the ’257 patent, col. 10, lns. 52-54;
- “In some constructions...the circuit 130 can include a semiconducting switch 180 that interrupts the discharging current when the circuit 130...determines or senses a condition above or below a predetermined threshold (*i.e.*, an “abnormal battery condition”); *id.* at col. 11, lns. 42-47
- “In some constructions, an abnormal battery condition can include...high or low battery state of charge...” *id.* at col. 11, lns. 47-49.

Accordingly, Hitachi’s proposed construction conflicts with these embodiments in the specification and is therefore an improperly limiting construction.

For this reason, the term “the control circuit further configured to control at least one function of the battery pack based on the monitored respective states of charge of the battery cells, the monitored state of charge of the battery pack or the monitored battery pack temperature” must be construed such that the control circuit is only required to be capable of monitoring each aspect of the battery cells and such that the control circuit is not limited by any temporal restrictions, as proposed by Metco.

**5. “heat sink in heat transfer relationship with the switch and operable to dissipate heat from the switch”**

Term	Metco’s construction	Hitachi’s construction
“a heat sink in heat transfer relationship with the switch and operable to dissipate heat from the switch”	“a device configured to dissipate heat from the switch”	“a heat exchange structure in the form of a heavy metallic mounting base or a set of radiating fins in physical contact with a hot portion the switch and operable to collect and remove heat generated by the switch by conduction the heat away from the switch”

The parties dispute centers around the meaning of the phrase “heat sink.” Hitachi proposes that the heat sink must be a specific type of metallic device and must be in physical contact with the switch, while Metco proposes that the heat sink need not take any specific form so long as it is capable of dissipating heat.

Metco’s proposed construction is consistent with the intrinsic evidence, including the specification of the ’257 patent, which does not limit the heat sink to any particular material, structural form, or physical location. Ex. 4, the ’257 patent, col. 18, lns. 33-35 (“The heat sink 275 may be formed of a metal (e.g., aluminum), a polymer (e.g., nylon), and/or any other material with high thermal conductivity and specific heat”); FIGS 13A-C, 15, 16; Claim 4. In short, the specification simply refers to the function of the heat sink, which is to dissipate heat from the switch. *Id.* at col. 16, lns. 57-61 (“The heat sink 275 can serve to remove heat generated by the switch 180 away from the switch 180.”)

Hitachi’s proposed construction import terms – like metallic and fins – from the specification into the claims, which the Federal Circuit has repeatedly said is improper. *Superguide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (holding that a particular embodiment appearing in the written description may not be read into a claim when

the claim language is broader than the embodiment); *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369 (Fed. Cir. 2002) (“The problem is to interpret claims ‘in view of the specification’ without unnecessarily importing limitations from the specification into the claims.”) As such, Hitachi’s proposed construction is improper for several reasons.

First, Hitachi’s construction is improperly limited to a metal device. This directly contradicts disclosed embodiments wherein the heat sink is not composed of metal. For example, the specification explicitly discloses that “[t]he heat sink 275 may be formed of a metal (e.g., aluminum), a polymer (e.g., nylon) and/or any other material with a high thermal conductivity and specific heat.” *Id.* at col. 18, lns. 27-35. Claim constructions that ignore or contradict disclosed embodiments are improper. *SanDisk Corp. v. Memorex Products, Inc.*, 415 F.3d 1278, 1285 (Fed. Cir. 2005) (patent claim construction that excludes preferred embodiment is rarely, if ever, correct). Further, Hitachi’s structural limitation for the heat sink – a “heavy metallic mounting base” and “set of radiating fins” – covers certain embodiments of the heat sink illustrated in the ’257 patent, but ignores the specification’s disclosure of alternatives because “[i]t should be understood that other heat sink and phase change material configurations are possible.” *Id.* at col. 18, lns. 31-33.

Second, Hitachi’s proposed construction is limited to a heat sink that is in physical contact with the switch. As with the metallic limitation, the requirement that the heat sink *must* be in physical contact with the switch is contrary to the specification. The specification only states that the heat sink *may* be in physical contact, not that it *must* be in physical contact with the switch. *Id.* at col. 16, lns. 58-59 (“The heat sink 275 *can be* in thermal communication with the power FET or switch 180.”) (emphasis added).

The specification's disclosure that physical contact between the heat sink and other components is optional is also supported by the language of the claims. Under the doctrine of claim differentiation, a court may not read into an independent claim a limitation expressly set forth in a dependent claim. *Environmental Designs, Ltd., v. Union Oil Co.*, 713 F.2d 693, 699 (Fed. Cir. 1983). *See also, Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004) (“Where the limitation that is sought to be ‘read into’ an independent claim already appears in a dependent claim, the doctrine of claim differentiation is at its strongest.”) In this case, dependent claim 4 of the ’257 patent claims a battery pack “wherein the switch is coupled to the heat sink.” Ex. 4, the ’257 patent, col. 37, lns. 8-9. Dependent claim 4, therefore, creates a strong presumption that the scope of claim 1 is broader, which in this case means that heat sink does not have to be in direct physical contact with the switch. *Phillips* 415 F.3d at 1314 (“the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim”).

Finally, Hitachi’s proposed construction is overly limiting and contrary to the way a person of ordinary skill in the art would understand the term. Ex. 8, Pl. Ex. Rpt. ¶ 32.

For this reason, the term “heat sink in heat transfer relationship with the switch and operable to dissipate heat from the switch” must be construed to cover any device that is capable of dissipating heat from the battery, as proposed by Metco.

**6. “the heat sink is in heat transfer relationship with the controller and operable to dissipate heat from the controller”**

Term	Metco’s construction	Hitachi’s construction
“The battery pack as set forth in claim 1 wherein <b>the heat sink is in heat transfer relationship with the controller and operable to dissipate heat from the controller.</b> ”	“a device configured to dissipate heat from the controller”	“the structure being in physical contact with a hot portion of the controller and operable to collect and remove heat generated by the controller by conducting the heat away from the controller”

As with the similar term in the ’257 patent, pg. 24 above, the dispute between the parties centers on whether the heat sink must be in physical contact with the controller. For this reason Metco incorporates its prior explanation into this section. In summary, Metco’s proposed construction is consistent with the claim language and the specification, which discloses a heat sink that may or may not be in physical contact with various components of the battery pack, not just the controller. *Id.* at col. 16, lns. 58-59 (“The heat sink 275 can be in thermal communication with the power FET or switch 180.”)

**C. The ’847 and ’654 Patents**

The ’847 patent is a continuation of the ’654 patent; as such, the two patents share a common specification and for this reason they will be addressed together, with all citations directed to the ’654 patent.

### **1. the '847 and '654 patents: “nominal voltage range”**

Term	Metco’s construction	Hitachi’s construction
“a nominal voltage range”	The term has an ordinary meaning that does not require further construction, but if the Court is inclined to construe this term, Metco proposes: “a range for the designated expected voltage”	“any voltage where the battery can reliably operate”

The parties have two primary disputes for this term. First, Metco proposes that this term does not require any construction because the fact finder should be able to rely on the ordinary meaning of these words. However, if this Court chooses to construe this term, then the second dispute is whether this term is limited to a voltage range, as proposed by Metco, or whether this term is broad enough to cover any voltage, as proposed by Hitachi.

As to the first dispute, Metco proposes that the term “nominal voltage range” does not require any construction because these words are already clear – adding a construction only serves to confuse and complicate the meaning. As noted by the Federal Circuit, “[i]n the absence of an express intent to impart a novel meaning to the claim terms, the words are presumed to take on the ordinary and customary meanings attributed to them by those of ordinary skill in the art.”

*Brookhill-Wilk I, LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1298 (Fed. Cir. 2003).

As to the second dispute, if this Court finds that “nominal voltage range” requires construction, then its definition should flow from the meaning that one of ordinary skill in the art would understand in view of the intrinsic evidence. The specification explicitly describes both the nominal voltage and nominal voltage range terms. With respect to any nominal voltage, the specification states that “[i]n another construction (see FIG 14), the battery 20A has a nominal voltage of approximately 28V. It should be understood that, in other constructions, the battery

20 may have another nominal voltage in another nominal voltage range.” Ex. 5, the ’654 patent, col. 3, lns. 32-35. In contrast, when the inventors chose to describe a nominal voltage range, they did so explicitly by describing the nominal voltage range as having an upper and lower boundary defined by two nominal voltages. *Id.* at col. 5, lns. 41-67 (“In some constructions, the range of acceptable nominal voltages can include a range from approximately 8 V to approximately 50 V. . . . In other constructions, the range of acceptable nominal voltages can include a range from approximately 12 V to approximately 28 V.”). The inventors’ explicit discussion of a voltage range in the specification should not be disregarded when construing that same term in the claims. For this reason, a person of ordinary skill in the art would understand that “a nominal voltage range” must include a range of possible voltages, as proposed by Metco.

In contrast, Hitachi’s proposed construction improperly broadens the term “voltage range” by removing any reference to an upper or lower limit on the voltage. As such, Hitachi’s construction ignores both the use of the word “range” in the claims and the explicit discussion of a voltage range in the specification. This is improper because patent claims must be “interpreted with an eye toward giving effect to all terms in the claim.” *Becton Dickinson and Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1257(Fed. Cir. 2010).<sup>3</sup>

For the above reasons, the term “nominal voltage range” does not require any construction because it is already clear. However, if this Court chooses to construe this term, then it must be construed to be limited to a voltage range, as proposed by Metco.

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<sup>3</sup> Further, Hitachi’s proposed construction is inconsistent with Hitachi’s later construction of the term “the second voltage range being different than the first voltage range.” There, Hitachi proposes a construction that includes the concept of “non-overlapping” ranges. Thus, while Hitachi proposes removing the “range” for this term, Hitachi proposes including the term “non-overlapping range” in the other term.

## 2. the '654 patent: “first nominal voltage range”

Term	Metco’s construction	Hitachi’s construction
“first nominal voltage in a nominal voltage range. . . . the second nominal voltage range being different than the <b>first nominal voltage range</b> .”	The term has an ordinary meaning that does not require further construction, but if the Court is inclined to construe this term, Metco proposes: “a first range for the designated expected voltage”	“any voltage where the battery can reliably operate”

The disputes regarding this term are the same as the disputes with respect to the similar term in the '654 patent, pg. 28 above, and for that reason Metco incorporates those arguments into this section. In summary, Metco proposes that the term “first nominal voltage range” does not require any construction because its plain and ordinary meaning is clear to a person of ordinary skill in the art. However, if this Court finds that a construction is needed, then it should follow the explicit language in the claim and in the specification, both of which discuss a range with an upper and lower bounds, as proposed by Metco. Ex. 8, Pl. Ex. Rpt. ¶ 38.

## 3. the '654 patent: “second nominal voltage range”

Term	Metco’s construction	Hitachi’s construction
“wherein the second nominal voltage is in a <b>second nominal voltage range, the second nominal voltage range</b> being different than the first nominal voltage range”	The term has an ordinary meaning that does not require further construction, but if the Court is inclined to construe this term, Metco proposes: “a second range for the designated expected voltage”	“any voltage where the battery can reliably operate, wherein the second nominal voltage range is non-overlapping with the first nominal voltage range”

The disputes regarding this term are the same as the disputes with respect the similar term at issue in the '654 patent, pg. 30 above, and for that reason Metco incorporates those arguments into this section. In summary, Metco proposes that the term “second nominal voltage range” does not require any construction because its plain and ordinary meaning is clear to a person of

ordinary skill in the art. However, if this Court finds that a construction is needed, then it should follow the explicit language in the claim and in the specification, both of which discuss a range with an upper and lower bounds, as proposed by Metco. Ex. 8, Pl. Ex. Rpt. ¶ 38.

**4. the '654 patent: “the second voltage range being different than the first voltage range”**

Term	Metco’s construction	Hitachi’s construction
“a second power tool operating in a second voltage range, <b>the second voltage range being different than the first voltage range</b> ”	“the second voltage range is not the same as the first voltage range”	“the second voltage range is non-overlapping with the first nominal voltage range”

The primary dispute with respect to this term is whether the phrase “different” allows for the first voltage range and the second voltage range to overlap, as proposed by Metco, or whether the first and second voltage ranges must be completely non-overlapping, as proposed by Hitachi.

Starting with the intrinsic evidence, the stated purpose of the invention is to have a single battery charger that is capable of charging batteries over a wide range of voltages (*i.e.* 14.4 V, 18 V, or 28 V). Ex. 5, the '654 patent, col. 1, lns. 55-58. This objective can only be met if the range of voltages that the battery charger can accommodate batteries with “different” voltages, but that are part of the same overlapping voltage range of the battery charger. For example, the specification describes a charger that can determine that the voltage range of the first battery is from 18 V to 22 V. Ex. 5, the '654 patent, col. 5, lns. 57-64. If this charger also determines that the voltage range of the second battery is from 20 V to 25 V, then the charger has identified two different voltage ranges for each battery, even though those voltage ranges overlap between 20 V and 22 V.

Despite this disclosure, Hitachi’s proposed construction forecloses this possibility by seeking to limit the charger to only being able to identify “non-overlapping” voltage ranges.

This proposed construction, however, is not supported by the claim language or disclosed at any point in the specification. In fact, it is directly contrary to the specification, which describes a charger that is capable of identifying the approximate voltage range of several batteries over a large overall voltage range. *Id.* at col. 5, lns. 40-56 (“the range of acceptable nominal voltages can include a range from approximately 8 V to approximately 50 V. . . . [or] the range of acceptable nominal voltages can include a range from approximately 12 V to approximately 28 V. . . . [or] the battery charger 30 can identify nominal voltages equaling about 12 V and greater.”) As a result, Hitachi’s proposal that the voltage range of each battery must be completely non-overlapping with the voltage range of all other batteries is contrary to the intrinsic evidence.

Accordingly, the intrinsic evidence supports Metco’s proposed construction that the charger is able to identify a voltage range for any given battery and that this voltage range can overlap with the identified voltage range of another battery.

### **5. the ’654 patent: “hand held power tool”**

<b>Term</b>	<b>Metco’s construction</b>	<b>Hitachi’s construction</b>
“wherein one of the first power tool and the second power tool is a <b>hand-held power tool</b> ”	“a power tool that can be held in and supported by the operator’s hand or hands”	“a power tool capable of being operated while held in the hand”

The primary dispute between the parties is the same as the dispute raised above with respect to the similar term in the ’290 patent. *See* pg. 13, above. For that reason, Metco incorporates those arguments into this section. In summary, the dispute is whether the hand held power tool must be capable of being held in a hand, as Metco proposes, or whether the hand held power tool must be merely operated by a hand, as Hitachi proposes. Metco’s proposed construction is proper because it is supported by the intrinsic evidence. The specification

references several hand held power tools, all of which can be held in a hand. Ex. 5, the '654 patent, claims 58 and 74; Figs. 15A-B. In contrast, Hitachi's proposed construction is broader than the specification because it could include tools that cannot be held in a hand, such as a fork lift or a drill press.

#### 6. the '847 and '654 patents: "state of charge"

Term	Metco's construction	Hitachi's construction
"wherein the first battery includes a first Lithium-based battery cell having a <b>state of charge</b> and wherein the battery charger is operable to identify the <b>state of charge</b> of the first Lithium-based battery cell"	"the amount of charge remaining"	"the amount of charge remaining at a given time for a battery cell"

The primary dispute between the parties is the same as the dispute raised above with respect to the similar term in the '257 patent. *See* pg. 14, above. For that reason, Metco incorporates those arguments into this section. In summary, the dispute here is whether this term should include the temporal limitation "at a given time," as Hitachi argues, or whether this term is not bound by any temporal limitation, as Metco proposes.

Metco's proposed construction is proper because it is supported by the intrinsic evidence. The specification regularly modifies the term "state of charge" with a temporal modifier when such limitation is intended, for example, by using the word "current" and "present." Ex. 4, the '257 patent, col. 16, lns. 8-23, col. 16, lns. 35-39, and col. 16, lns. 51-54. Furthermore, if the term "state of charge" should not have any temporal limitations, then the specification does not include any modifying language. *Id.* at col. 16, lns. 23-31, col. 16, lns. 40-54, col. 16, ln. 64 – col. 17, ln. 5 (describing a "state of charge" as an approximation, average, estimate, or other representations of the amount of charge that are not exact and not bounded by time). Despite

this, Hitachi's proposed construction seeks to improperly limit this term with the temporal phrase "at a given time" even though the claim language does not include any temporal modifiers.

**7. the '654 patent: "battery charger is operable to identify the state of charge of the first Lithium-based battery cell and to charge the first battery cell based at least in part on the state of charge of the first Lithium-based battery cell"**

Term	Metco's construction	Hitachi's construction
<p>"wherein the first battery includes a first Lithium-based battery cell having a state of charge and wherein <b>the battery charger is operable to identify the state of charge of the first Lithium-based battery cell and to charge the first battery based at least in part on the state of charge of the first Lithium-based battery cell</b>"</p>	<p>"battery charger is operable to identify the amount of charge remaining in the first Lithium-based battery cell and to charge the first battery after considering the amount of charge remaining in the first Lithium-based battery cells, though other information can also be used or considered."</p>	<p>Must be Construed Pursuant to 35 U.S.C. § 112, ¶ 6:  Function: identify the individual state of charge of the first Lithium-based battery cell and to charge the first battery based at least in part on the individual state of charge of the first Lithium-based battery cell.  Structure: control device, microcontroller, microprocessor or controller specifically programmed to identify the individual state of charge of the first Lithium-based battery cell and to charge the first battery based at least in part on the individual state of charge of the first Lithium-based battery cell.</p>

The dispute between the parties is whether this term, and in particular the "battery charger" limitation, must be construed pursuant to 35 U.S.C. § 112, ¶ 6 as a means-plus-function claim, as Hitachi proposes, or whether this term is not subject to 35 U.S.C. § 112, ¶ 6, as Metco proposes.

As discussed above in the legal section, means-plus-function terms are construed to cover the corresponding structure described in the specification for performing the claimed function

and its equivalents. 35 U.S.C. § 112, ¶ 6, *see* pg. 4, above. The Federal Circuit has held that when the claim language does not include the term “means” there is a rebuttable presumption that §112, ¶ 6 does not apply. *Lighting World, Inc. v. Birchwood Lighting*, 382 F.3d 1354, 1360-61 (Fed. Cir. 2004). In this case, the claim term does not use the word “means,” so there is a rebuttable presumption that 35 U.S.C. § 112, ¶ 6 does not apply. This presumption can only be overcome if Hitachi proves that the claim term fails to recite sufficiently definite structure. *Id.*<sup>4</sup> The Federal Circuit has made clear, however, that the “presumption flowing from the absence of the term ‘means’ is a strong one that is not readily overcome.” *Id.*<sup>5</sup>

In this case, Hitachi cannot meet this burden because the claim term recites sufficiently definite structure when it recites a “battery charger.” A person having ordinary skill in the art recognizes that the primary purpose of the battery charger is to restore the charge to a battery. Ex. 8, Pl. Exp. Rpt. ¶ 45. This requires, at a minimum, some circuitry for both detecting a state of low charge and generating current to restore the charge to the battery. *Id.* As a result, this recitation of a “battery charger” identifies, to a person having ordinary skill in the art, sufficiently definite structure, in the form of certain circuitry that can charge the battery pack.<sup>6</sup> As a result, the claim language sufficiently describes the battery charger such that Hitachi cannot overcome the presumption that this term should not be construed pursuant to 35 U.S.C. §112, ¶ 6. Accordingly, Metco’s proposed construction should be adopted.<sup>7</sup>

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<sup>4</sup> Citing *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1369 (Fed. Cir. 2002) (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)).

<sup>5</sup> Citing *Al-Site Corp. v. VSI Int’l, Inc.*, 174 F.3d 1308, 1318-19 (Fed. Cir. 1999); *Personalized Media Comms., LLC v. Int’l Trade Comm’n*, 161 F.3d 696, 703 (Fed. Cir. 1998).

<sup>6</sup> This circuitry is also disclosed in various embodiments in the specification that identify the state of charge and charge the battery. Ex. 5, the ’654 patent col. 16, lns. 16-39.

<sup>7</sup> If this Court does interpret this term as a means-plus-function limitation, then the first step is to identify the claimed function, while staying true to the claim language and its functional

## D. The '167 Patent

### 1. “sense terminal”

Term	Metco's construction	Hitachi's construction
“a sense terminal to electrically connect to a power tool battery pack supported by the housing”	“a terminal used to communicate information about one or more characteristics of the battery pack”	“a terminal, separate and distinct from the positive terminal and negative terminal of the battery charger, positioned in the battery charger that is used to transfer information between the battery pack and the battery charger”

The primary dispute is whether the sense terminal must be separate and distinct from the positive and negative terminals of the battery charger and positioned in the battery, as proposed by Hitachi, or whether any terminal that can communicate information about the battery pack to the charger qualifies as a sense terminal, as proposed by Metco. This difference is important because under Hitachi's proposed construction, a terminal that communicates information about the battery pack to the charger loses its status as a sense terminal if it is also used to transmit current from the battery pack to the charger.

Metco's proposed construction follows the claim language in that it simply states that the sense terminal must be able to communicate information from the battery pack. Metco's proposed construction also takes into account and is consistent with the breadth of all of the disclosures in the specification. In certain circumstances, the specification discloses that a sense terminal acts to transfer information between the battery pack and the battery charger. Ex. 7, the '167 patent, col. 10, lns. 61-64. In other circumstances, this same information may be

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limitation as expressly stated in the claim. *See, e.g., Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1332 (Fed. Cir. 2006). The second step is to identify structure that is clearly linked to the claimed function recited in the claim. *Applied Med. Res.*, 448 F.3d at 1332; *JW Enters., Inc. v. Interact Accessories, Inc.*, 424 F.3d 1324, 1330 (Fed. Cir. 2005).

transferred through other structures, which may or may not be “separate and distinct” from the sense terminal or “positioned in the battery charger.” *Id.* at col. 15, ln. 63- col. 16, ln. 8; col. 5, lns. 35-41. There is nothing in the specification that expressly limits the sense terminal to the preferred embodiments, and in fact, the specification explicitly states the claims are not to be so limited and that the process of communicating information could take various other forms. *Id.* at col. 20, lns. 60-67 (“The constructions described above and illustrated in the figures are presented by way of example only and are not intended as a limitation upon the concepts and principles of the present invention. As such, it will be appreciated by one having ordinary skill in the art that various changes in the elements and their configuration and arrangement are possible without departing from the spirit and scope of the present invention.”)

Hitachi’s proposed construction is flawed because it attempts to include two limitations—“separate and distinct,” and “positioned in the battery pack charger”—into this term even those limitations are not present in the claim. The Federal Circuit holds that it is improper to rely on one embodiment while ignoring the broader scope of the claim language. *Superguide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (“Though understanding the claim language may be aided by explanations contained in the written description, it is important not to import into a claim limitations that are not part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.”). As a result, Hitachi’s proposed construction improperly narrows this claim despite the broad disclosures in the specification.

For the above reasons, the term “sense terminal” must be construed to simply be able to communicate information about the battery pack to the charger, as proposed by Metco.

## 2. “individual state of charge”

Term	Metco’s construction	Hitachi’s construction
“each battery cell of the plurality of battery cells having an <b>individual state of charge</b> ”	“the amount of charge remaining in a battery cell”	“the amount of charge remaining at a given time for an individual battery cell”

The primary dispute between the parties is the same as the dispute raised above with respect to the similar terms in the ’257 and ’654 patents. *See* pgs. 14 and 33, above. For that reason, Metco incorporates those arguments into this section.

In summary, the dispute here is whether the claims should include the temporal limitation “at a given time,” as Hitachi argues, or whether this term is not bound by any temporal limitation, as Metco proposes. Metco’s proposed construction is proper because it is supported by the intrinsic evidence. The specification regularly modifies the term “state of charge” with a temporal modifier when such limitation is intended, for example, by using the word “present.” Ex. 7, the ’167 patent, col. 16, lns. 3-8 (“[i]n some constructions, the microcontroller 64 can monitor various battery characteristics during charging, including the voltages or present state of charge of each battery cell 60...”) Furthermore, if the term “state of charge” should not have any temporal limitations, then the specification does not include any. *Id.* at col. 16, ln. 65- col. 17, ln. 3 (describing a “state of charge” that can be estimated and is not bounded by any temporal restrictions). In contrast, Hitachi’s proposed construction seeks to limit this term with the temporal phrase “at a given time” even though the claim language does not include any temporal modifiers.

**3. “controller being operable to control the charging current being supplied to the battery pack based at least in part on the individual state of charge of at least one battery cell”**

Term	Metco’s construction	Hitachi’s construction
“a controller operable to supply a charging current to the battery pack through at least one of the positive terminal and the negative terminal, the <b>controller being operable to control the charging current being supplied to the battery pack based at least in part on the individual state of charge of at least one battery cell</b> ”	“controller being operable to control the charging current being supplied to the battery pack after considering the amount of charge remaining in at least one battery cell, though other information can also be used or considered”	Must be Construed Pursuant to 35 U.S.C. § 112, ¶ 6: Function: control the charging current being supplied to the battery pack based on the individual state of charge of at least one battery cell. Structure: microprocessor specifically programmed to control the charging current being supplied to the battery pack based on the individual state of charge of at least one battery cell.

The dispute is whether this term, and in particular the “controller” limitation, must be construed pursuant to 35 U.S.C. § 112, ¶ 6 as a means-plus-function claim, as Hitachi proposes, or whether this term is not subject to 35 U.S.C. § 112, ¶ 6, as Metco proposes. As discussed above, this claim term does not use the word “means,” so there is a rebuttable presumption that 35 U.S.C. § 112, ¶ 6 does not apply, and Hitachi can only overcome this presumption by proving that the claim term fails to recite sufficiently definite structure. *Lighting World, Inc. v. Birchwood Lighting*, 382 at 1360-61.

Hitachi cannot rebut the presumption because the term “controller” recites sufficiently definite structure. In prior cases, the Federal Circuit has interpreted the term “controller” and has held that it “denotes a type of device with a generally understood meaning in the mechanical arts.” *Lighting World*, 382 F.3d at 1360 (citing *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996)). The Federal Circuit has also expressly held that the term “controller” should not be interpreted under 35 U.S.C. § 112, ¶ 6 because it is neither a “generic

structural term” nor a “coined term lacking a clear meaning.” *Id.* at 1358 (*citing Personalized Media Cmmc’ns., LLC v. Int’l Trade Comm’n.*, 161 F.3d 696, 704 (Fed. Cir. 1998)). As a result, the Federal Circuit held that a person of ordinary skill in the art would clearly understand the term “controller” to cover a broad class of possible structures, including microprocessors, microcontrollers, programmable logic arrays, application specific integrated circuits and the like. *Id.* at 1360 (*citing Greenberg*, 91 F.3d at 1583). This is confirmed by Metco’ expert, who opined that a person of ordinary skill in cordless power tool industry would understand that the word “controller” describes any one of many well known structures. Ex. 8, Pl.’s Ex. Rpt. ¶ 55-56. As a result, Hitachi cannot rebut the presumption that this term should not be interpreted under 35 U.S.C. § 112, ¶ 6 and Metco’s proposed construction should be adopted.

**4. “each battery cell of the plurality of battery cells is individually tapped”**

Term	Metco’s construction	Hitachi’s construction
“wherein <b>each battery cell of the plurality of battery cells is individually tapped</b> such that the controller is operable to monitor the respective individual state of charge thereof via the sense terminal.”	“each battery cell of the plurality of battery cells is configured with an individual intermediate electrical connection to the circuit.”	“each cell has a distinct electrical connection or lead to both of its end terminals such that the state of charge for each of the cells can be individually monitored”

The primary dispute between the parties is whether the term “individually tapped” should be construed as simply an electrical connection, as proposed by Metco, or whether it should be construed as a distinct electrical connection attached to both end terminals of the battery cells, as proposed by Hitachi. The difference is important because the two proposed constructions recite distinctly different physical arrangements.

Metco’s proposed construction is consistent with the intrinsic evidence. The specification discloses several embodiments of a controller that can monitor each individual

battery cell without an electrical connection on both ends of the cell. For example, the specification explicitly discloses that the charger is able to estimate the voltage of each cell based on the voltage of the entire battery pack. Ex. 7, the '167 patent, col. 16, ln. 65 - col. 17, ln. 5 (“During the subsequent current on time period  $T_{on2}$ , the battery charger 30 “estimates” the voltage of cell 5. For example, the battery charger 30 samples measurements of the voltage of the battery 20, and for each battery voltage measurement, estimates the state of charge for cell 5”). For this reason, the term “individually tapped” should not be limited to a construction where the controller must be directly electrically connected to both ends, as suggested by Hitachi because it would improperly import limitations from a preferred embodiment into the claims.

Furthermore, one of ordinary skill in the art would also be familiar with a number of ways to individually tap the battery cells, many of which would not require a distinct electrical connection or lead to both of its end terminals. Ex. 8, Pl.’s Ex. Rpt. ¶ 57-58. For this reason as well, Hitachi’s proposed construction would improperly limit the scope of this claim, while Metco’s proposed construction properly identifies that the scope of this term must simply state that any electrical connection that can monitor the voltage of a cell adequately describes a cell that is individually tapped.

**5. “controller is operable to monitor the respective individual state of charge thereof via the sense terminal”**

Term	Metco’s construction	Hitachi’s construction
“wherein each battery cell of the plurality of battery cells is individually tapped such that the <b>controller is operable to monitor the respective individual state of charge thereof via the sense terminal.</b> ”	“controller is operable to monitor the amount of charge remaining in the battery cell via the sense terminal”	<p>Must be Construed Pursuant to 35 U.S.C. § 112, ¶ 6:</p> <p>Function: observe the respective individual state of charge of each battery cell via the sense terminal.</p> <p>Structure: microprocessor specifically programmed to observe the respective individual state of charge of each battery cell via the sense terminal.</p>

As with a similar term in the ’167 patent, pg. 40 above, the dispute here is whether this term, and in particular the “controller ” limitation, must be construed pursuant to 35 U.S.C. § 112, ¶ 6 as a means-plus-function claim. As discussed above, the Federal Circuit has held that that the term “controller” recites definitive structure and should not be interpreted under § 112, ¶ 6, and Metco’s expert has confirmed this conclusion from the perspective of a person of ordinary skill in the art. Pl. Ex. Rpt. ¶ 59-60. As a result, Hitachi is unable to rebut the presumption that 35 U.S.C. §112, ¶ 6 does not apply, and Metco’s proposed construction should be adopted.

**6. “each battery cell of the plurality of battery cells being individually tapped such that its respective individual state of charge is monitorable”**

Term	Metco’s construction	Hitachi’s construction
“at least three battery terminals supported by the battery housing and electrically connected to the plurality of battery cells, the at least three battery terminals including a sense terminal, <b>each battery cell of the plurality of battery cells being individually tapped such that its respective individual state of charge is monitorable”</b>	“each battery cell being configured with an electrical connection that allows the amount of charge remaining in a battery cell to be monitorable”	“each cell has a distinct electrical connection or lead to both of its end terminals such that the state of charge for each of the cells can be individually monitored”

The primary dispute for this term is the same as the dispute with respect to the similar term in the ’167 patent, pg. 41 above, and for that reason Metco incorporates the explanation above for this term. In summary, Hitachi’s proposed construction attempts to limit the claim to a one specific embodiment, while Metco’s proposed construction flows from the intrinsic evidence that discloses several different ways of monitoring the voltage of an individual cell.

**7. “sense terminal” and “charger sense terminal”**

Term	Metco’s construction	Hitachi’s construction
“at least three charger terminals to electrically connect to the at least three battery terminals, the at least three charger terminals including a <b>charger sense terminal”</b>	“a terminal of the charger used to communicate information about one or more characteristics of the battery pack”	“a terminal, separate and distinct from the positive terminal and negative terminal of the battery charger, that is used to transfer information between the battery pack and the battery charger”

The primary dispute for this term is the same as the dispute with respect to similar term in the ’167 patent, pg. 37 above, and for that reason Metco incorporates the argument above for this term. In summary, Hitachi’s proposed construction attempts to limit the claim to a one specific

embodiment with the words “separate and distinct.” Metco’s proposed construction, however, flows from the intrinsic evidence that discloses several different ways of monitoring the voltage of an individual cell. *See, e.g.*, Ex. 7, the ’167 patent, col. 10, lns. 61-64, col. 15, ln. 63 – col. 16, ln. 8, col. 5, lns. 35-41, and col. 20, lns. 60-67.

**8. “the controller being operable to control the charging current being supplied to the battery based at least in part on an individual state of charge of at least one battery cell monitored via the charger sense terminal”**

Term	Metco’s construction	Hitachi’s construction
“a controller operable to supply a charging current to the battery through at least one of the at least three terminals, <b>the controller being operable to control the charging current being supplied to the battery based at least in part on an individual state of charge of at least one battery cell monitored via the charger sense terminal.</b> ”	“the controller being operable to control the charging current being supplied to the battery after considering the amount of charge remaining in at least one battery cell monitored via the charger sense terminal, though other information can also be used or considered”	<p>Must be Construed Pursuant to 35 U.S.C. § 112, ¶ 6:</p> <p>Function: control the charging current being supplied to the battery pack based in part on the individual state of charge of at least one battery cell observed via the charger terminal.</p> <p>Structure: microprocessor specifically programmed to control the charging current being supplied to the battery pack based at least in part on the individual state of charge of at least one battery cell observed via the charger terminal.</p>

As with the similar terms in the ’167 patent, pgs. 40 and 43, above, the dispute is whether this term, and in particular the “controller ” limitation, must be construed pursuant to 35 U.S.C. § 112, ¶ 6 as a means-plus-function claim. For all the reasons discussed above, Hitachi is unable to rebut the presumption that §112, ¶ 6 does not apply, and Metco’s proposed construction should be adopted.

**9. “the controller being operable to control the charging current being supplied to the battery based at least in part on an individual state of charge of at least one battery cell, wherein the individual state of charge of at least one battery cell is communicated to the controller via the sense terminal”**

Term	Metco’s construction	Hitachi’s construction
<p>“a controller operable to supply a charging current to the battery pack through at least one of the positive terminal and the negative terminal, <b>the controller being operable to control the charging current being supplied to the battery pack based at least in part on the individual state of charge of at least one battery cell, wherein the individual state of charge of at least one battery cell is communicated to the controller via the sense terminal.”</b></p>	<p>“the controller being operable to control the charging current being supplied to the battery after considering the amount of charge remaining in at least one battery cell (though other information can also be used or considered), wherein the amount of charge remaining in at least one battery cell is communicated to the controller via the sense terminal”</p>	<p>Must be Construed Pursuant to 35 U.S.C. § 112, ¶ 6:</p> <p>Function: control the charging current being supplied to the battery pack based on the individual state of charge of at least one battery cell, wherein the individual state of charge of at least one battery cell is communicated to the controller via the sense terminal.</p> <p>Structure: microprocessor specifically programmed to control the charging current being supplied to the battery pack based on the individual state of charge of at least one battery cell, wherein the individual state of charge of at least one battery cell is communicated to the controller via the sense terminal.</p>

As with the similar terms in the ’167 patent, pgs. 40, 43, and 45, above, the dispute here is whether this term, and in particular the “controller” limitation, must be construed pursuant to 35 U.S.C. § 112, ¶ 6. For all the reasons discussed above, Hitachi is unable to rebut the presumption that § 112, ¶ 6 does not apply, and Metco’s proposed construction should be adopted.

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Respectfully submitted,

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**CERTIFICATE OF SERVICE**

I hereby certify that on May 25, 2012, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system, which will automatically send e-mail notification to the Court and to attorneys of record.

/s/ Jason C. White  
Jason C. White